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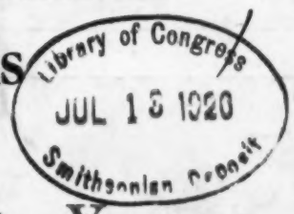

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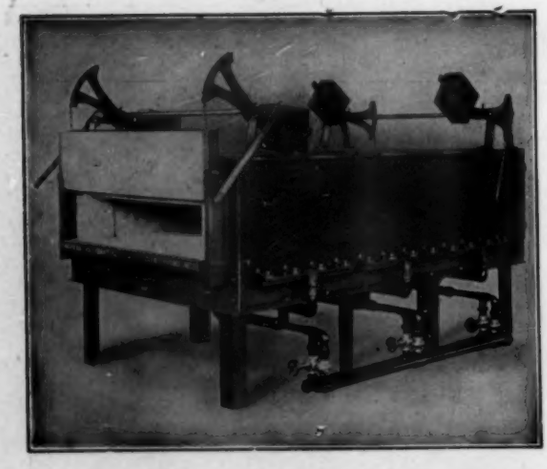

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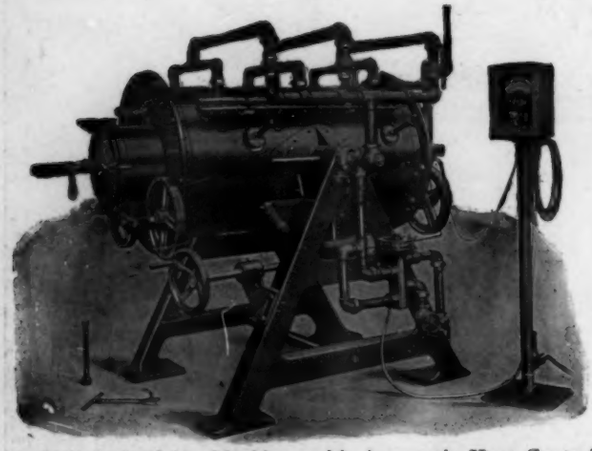

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SIXTY-SEVENTH YEAR

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AMERICAN
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The Baltimore System of Industrial Education

IV. "Training in" the new employee

E. B. Luce

Educational Director, the Consolidated Gas, Electric Light and Power Co., of Baltimore, Md.

THE Consolidated Gas, Electric Light and Power Company of Baltimore has been in operation for a long time, the gas branch for more than a century and the electrical branch for forty-three years. During these periods it has, like other companies, accumulated a vast quantity of information and experience. Much of this information and experience is not available generally because it is stored in the minds of old employes and has never been formulated systematically and made a matter of record.

This is necessary in order to have subject matter for the training of new employes. An important phase of the educational work of the company, therefore, in order to make this information and knowledge available, is the preparation in the form of blue books, of manuals, service guides, standardized practices and short cut methods. To do this requires the thoughtful and sympathetic cooperation of large numbers of employes. Fortunately for the success of this endeavor, this company's unique success in other lines in the past, is due quite largely to the fact that it is founded upon the keystone of cooperation. The following Blue Books, fit-the-pocket-size, have been issued through the library or are in preparation:

1. Electric Rates and Rate Making.
2. Educational Opportunities and Regulations.
3. Information for the New Employe.
4. A Manual for Meter Readers and Bill Distributors.
5. Service Manual—A Guide for Customers*.
6. Correspondence Manual*.
7. Gas Manufacture*.

* In Preparation.

This series of Blue Books, together with other available material issued by the company in the form of House Organs, Year Books, A. B. C. Primer, etc. is most useful in "training in" new employes.

Purpose of Manuals

The foremost purpose in preparing manuals, codes, handbooks, or other similar booklets by whatever name known, is to improve the work itself which is to be done. When directions are written they must be more specific. In their preparation, thought is stimulated; former practices are challenged and new ideas for desirable and advisable changes are born. After they are written, both supervision and execution are easier, also more intelligent and effective. In the preparation itself the way is opened for the elimination of obsolete practices and a corresponding modification of the organization.

Another important purpose in the preparation of manuals is to get material in tangible form for the instruction of new employes. Such manuals or working instructions are definite, authentic and complete whereas oral directions are often incomplete or forgotten altogether. Consequently the employe often blunders, and often fails. With the trade intelligence and skill that should come from definitely planned and effective training, men who have been trained to do their work well from the start are more likely to be satisfied with their jobs, stay on them and thus reduce turnover. Men trained to do their work under close supervision should work faster and more skillfully so that the results of training should

show an increased speed of production and a smaller junk pile.

The Human Touch

To "train in" the new employe requires also the human touch and personal guidance. To meet this situation the company has employed a field worker, who works under the direction of the Educational Dirèctor. Training representatives, one more in each department, meet the new employe on the job and give him help, guidance, and instruction in accordance with the plans worked out by the Educational Department. There are now thirty-four training representatives selected within the departments to carry on this work under the supervision of the field worker of the educational department. Others will be selected as this work is extended. Some of the guiding principles of this new effort are as follows:

1. Simplicity. The forms, language, methods and whole procedure in relation to this work are so simple that "he who runs may read."

Assembly of Workers for Group Educational Work on the Subject of "Safety"

2. Understanding. The program is unfolded as rapidly as the field worker of the educational department can explain and convey complete understanding to the department heads and others who may be concerned. This will involve the selection of the training representatives in various departments and personal conferences before any letters or other printed instruction or guides are issued.

3. Automatic. The plan and methods are laid so that "training in" work for each new employe starts automatically with his entrance to the job. This means essentially that the training representative in his department will supply him with the necessary material and directions.

4. Supervision. The field worker of the educational department supervises the work, gives continuous study to the problem and makes personal contacts so far as possible.

5. Performance. The test of completion of the training period for the new employe is based upon performance of his duties and responsibilities to the satisfaction of those responsible for his work. Certification of satisfactory performance requires the signature of the Department's training representative on the training guide and record sheet. As this work develops and opportunity for studying it further is offered, there should be continued effort to work out standardized units of work with which to test the performance of the new employe.

Working Instructions

Working instructions for the job as a whole will be worked out by the new employe himself who will get the necessary information from the training representative; from an old employe who knows the job; from supervisors, superintendents and any others who may have something to contribute; also from available company descriptions of the job and other material related to it.

These "working instructions" worked out as indicated by one new employe on a job, will be given to the next employe on the same job, for his guidance and for correction and revision. To the new employe will also be given a "training guide and record sheet", on this sheet will be given the items which the new employe will be expected to cover in one week, including items of work and very often reading and study assignments. The "training guide and record" is a single sheet with directions on one side and spaces on the other for the employe's use in recording his progress for one week. For each week while in "training in" status, the employe will have one "training guide and record sheet." Thus the employe in training can concentrate on the particular matters immediately before him, and progress in an orderly manner; and, for the Company, it will be possible ultimately to perfect its training methods and determine the average length of the "training in" period for various jobs and also the cost to the Company for training in its new employes.

The Library

The library was first organized in 1914 by making a collection of books scattered in various offices of the company. These books were catalogued and made available for general use. In May 1924, the library was made a part of the Educational Department.

The main branch of the library is equipped with fifteen closed book cases used for technical books and pamphlets, and two open cases for fiction books. The room used for our library is located on the 6th floor of the Lexington building, and is about 18' x 36'. It is well lighted and ventilated. The furniture is attractive and comfortable. In addition to the main library there are branches at Monument Street, Front Street, Spring Gardens, and Westport. At each of these stations a particular phase of the company's work is carried on; books pertaining to each kind of work are placed accordingly at the branch libraries.

The library is used extensively for reference work

pertaining to matters of company business, general information and evening school courses.

The chief purpose of the company's library is to keep employes of the company well informed on matters of interest and importance in their work.

In order to give this service, the librarian scans all magazines for articles pertaining to the gas and electric industry and refers any such articles which she finds to the persons in the company who are concerned.

Circulated Magazines

The following magazines are circulated from the library on a three days free circulation basis:

American
American Gas Association Bulletin of Abstracts
American Gas Association Monthly
American Gas Journal
Bell System Technical Journal
Bell Telephone Quarterly
Bulletin of the American Institute of Accountants
Commerce, Finance and Industry
Commerce Monthly
Current Opinion
Electric Light and Power
Electrical World
Engineer
Factory
Forbes
Gas Age Record
Gas Industry
Good Housekeeping
Harvard Economic Service
Harvard Business Review (Quarterly)
Heating and Ventilating
Industrial Digest
Industrial Gas
Industrial Management
Journal of the A. I. E. E.
Journal of Accountancy
Journal of Electricity
Lamps
Literary Digest
100% Management
Management and Administration
National Safety News
N. E. L. A. Bulletin
Official Guide of Railways
Pictorial Review
Popular Mechanics
Popular Science Monthly
Power
Public Service Management
Public Utility Questions and Answers
Public Utility Reports
Radio Broadcast
Radio News
Radio World
Rate Research
Review of Economic Statistics
Review of Reviews
Scientific American
Success
Survey of Current Business
System
Woman's Home Companion

Employes may subscribe for certain magazines pertaining to their particular line of work at one-half the normal subscription price, the company paying the other half. These magazines are mailed direct to the employes and retained by them. The following magazines are available to employes on the 50-50 basis. This list is modified from time to time to meet the changing needs of the company's business.

American Gas Journal
Automotive Industries
Chemical and Metallurgical Engineering
Coal Age
Display World
Electrical Merchandising
Electrical Journal
Electrical World
Engineering News Record

Meeting of Department Training Representatives and Group Heads

Gas Age Record
General Electric Review
Industrial Engineer
Industrial Gas
Journal of Accountancy
Lefax
Management and Administration
Mechanical Engineering
Motor Vehicle Monthly
Pace Student
Plumbers and Steam Fitters Journal
Power
Power Plant Engineering
Signs of Times

A number of magazines are also received in the departments and are circulated to employes in that department. The entire cost of these magazines is borne by the company.

Reading List

The librarian, after carefully reading current magazines, selects articles of general interest and prepares a reading list, which is circulated in all de-

partments. Persons selecting articles of interest from this list, return it to the library with the article checked. These articles are sent to the persons requesting them as soon as available.

Most of the books purchased for the library are bought upon the recommendation of one of more employes. All books are charged to the library and are catalogued before distribution. This method enables the librarian to know where information is available although the books may not be kept in the library.

Text books for reference use are kept in the library. It is our aim to purchase those text books which are used by the majority of employes who are attending night school classes.

The library is used as a reading room during the noon day lunch periods. Many of the employes prepare their lessons here. The office boys and junior clerks spend a great part of their lunch-time in the library reading and studying.

Very few books other than technical are kept in the library. However, we borrow each month from the City's Free Library, fiction books which are circulated to our employes on a two weeks basis. In addition to books obtained from the City Library, through cooperative arrangements we are enabled to draw books from the Johns Hopkins Library, Peabody Library, and several other private libraries so that our resources are practically unlimited.

The good which the library can accomplish depends largely upon the use made of it. For that reason we try to study the interests of each employe and obtain for him the book or magazine in which he is interested and which will meet his needs on the job.

Utilization of Library

The utilization of the library itself is measured by the number of daily patrons, calling in person to read, study, draw books, or request assistance; by the telephone requests received for books and magazines, and for the Librarian's assistance in looking up references; by the number of magazines received and routed daily to employes on the circulation list and in response to the weekly reading list; by the number of subscriptions placed for magazines under the company's liberal offer of paying for employes one-half of the subscription price; also by the number of magazines and books reviewed daily for the purpose of calling the attention of those concerned to interesting and helpful articles in relation to the company's business.

The utilization of individual reference books is measured by the number of withdrawals under a specific classification such as Chemistry, Accounting, financial, technical, etc.; by the number of times used in the library itself by employes for reference, which often is more helpful to the employe than when withdrawn because he has the assistance of the librarian; also by the number of times referred to by the librarian herself in giving out information in answer to telephone requests.

Apprenticeship Training

The Student Apprentice Course has been in operation since 1915. It is primarily intended for training technical graduates for regular positions not only in electrical operating departments, but in other departments as well where such men may be used. The object of the course, however, is not only to develop men, but to give a fair and ample trial of their ability to fit into our organization. It thus affords both the man and the company an excellent means of judging the man's fitness and liking for the different classes of work in the various departments.

The men are given both routine and special work in the various departments, thus enabling them to learn something about the work handled and the methods of conducting these departments. They get practical exeperience in shop, field, drafting, testing and office work and learn something of business methods. It affords an excellent opportunity of getting experience in the workings of a large power company.

Supervision and Instruction

The Educational Department will, as plans develop, assume the direction and co-ordination of the Student Apprentice Course. At present the course is under the general supervision of the Chief Electrical Engineer. The detail work of directing, instructing and observing the progress of the men is done by the Chief of Test, an instructor in Electrical Engineering at the night school for technical workers at the Johns Hopkins University, who keeps in close touch with all concerned. The men are also instructed and observed by those in charge of the particular departments in which they may be working.

The work of each student is discussed both with those in charge and with the man himself and advice is given, so that the student is thus afforded a chance to correct any faults, to improve himself and to adjust any difficulties that may arise. Careful records are kept of the work of the men in each department.

Eligibility for Course

There are two main classes of students eligible for the course; the first class—graduates of standard four years technical schools or their equivalent; the second class—graduates of secondary technical schools, such as the Baltimore Polytechnic, or the equivalent. The reason for this is that all positions do not require technical education of the first class. The members of the more highly trained group are paid $25.00 per week and those taken from secondary schools $18.00 per week.

Graduates from mechanical, electrical, civil or equivalent scientific courses are equally eligible, but the relative number of each class selected depends upon the requirements of the company at the time.

Regular Positions

Student apprentices are given full consideration in filling available openings for which they may be suited. A number of men from the course have been given positions of usefulness and responsibility in the company. However, neither the company nor the men are under obligation to continue the employment or after completion of the course, since it is desirable that all sides be satisfied.

Departments Covered

The departments included in the course are: Electrical Distribution, Electrical Engineers, Drafting, Meter and Installation, Electric Stations, Electric Test, Electrical Construction, Building Construction, Steam Stations, Industrial Power & Fuel, Electrical Statistics, and Merchandise Department. A student is not expected to go through all of these departments, but some are optional and a few are taken only in special cases. The normal course takes one year covering six departments. A man is allowed to take more departments if he so desires. The length of time in each department is about two months, except where special conditions make it desirable to increase or decrease the time, for example when a man is training for some particular line of work.

Prizes for Efficiency Suggestions

The Management invites original ideas from employes along any lines of improvement or development, which will produce net operating savings.

For adopted suggestions which are estimated to produce a net operating saving, after due allowance for capital or other costs, of

$5,000 or over per year	$250.00 award
1,200 or over per year	100.00 award
500 or over per year	50.00 award
100 or over per year	25.00 award

For suggestions that produce savings of less than $100 per year or suggestions adopted not because of definite saving, an award of $10 will be made.

It is desired to provide as much freedom from restrictions as possible, but as a protection to the suggestors and for necessary committee information, a few simple rules are needed; to wit

1—Suggestions must be original and the committee has the right to reject those covered by previous suggestions.

2—When an employe starts to develop a suggestion requiring time to complete his case, a brief, written statement must be filed with the committee; otherwise, the employe has no guarantee his suggestion will not be duplicated with the committee. This is also needed to help the committee determine the responsibility for the suggestion.

3—The employe may have the assistance and advice of the department head and the members of the committee, but he must finally present his suggestion sufficiently complete in detail to demonstrate its originality, practicability, and worth.

4—Department heads (as to work under their supervision) and those assigned to investigations are not eligible to prize award.

A committee of four selected employes receive and review all efficiency suggestions and recommend awards.

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RADIO PUBLIC AIDED BY GAS COMPANIES

As a part of the service that gas companies are rendering to industry and the radio public, recent laboratory investigations by the Metallurgical Laboratory of The Peoples Gas Light and Coke Company, Chicago, Ill., have resulted in a better radio tube. The work done involves radio tubes in which the nickelplate in the grid of the tubes is degasified.

Nickel, it seems, will absorb vagrant gases. When the necessary vacuum is pumped, the gases will come out of the nickel. This renders the tubes very unsatisfactory.

The Peoples Gas Light and Coke Company has perfected a process wherein these vagrant gases are driven out of the nickel before the vacuum is pumped. A hydrogen reduction furnace solved the problem.

✡ ✡ ✡ ✡

GAS HOLDERS NAMED "FUEL BIN" BY PACIFIC GAS AND ELECTRIC COMPANY

All gas holders of the Pacific Gas and Electric Company have recently been painted with the words "Fuel Bin" in letters fifteen feet high, which can be seen for miles, providing some very desirable publicity for the company. The words "Fuel Bin" are now looked upon as the trade name for the company. Now when people see the words "Fuel Bin" they think of the Pacific Gas and Electric Company, just as they think of Heinz when they see the figure 57.

The Story of Carburetted Water Gas

Six periods of development are outlined

T. W. Stone

Chief Engineer, Western Gas Construction Company, Fort Wayne, Ind.

THE story of carburetted water gas goes back a long way in years at least, if not in practice and development, beyond the beginning of the water gas machine as we know it today.

From the beginning of the nineteenth century, there was curiosity, experimenting and trials of water gas in a crude way. In the 50's and 60's this had advanced until there were workable plants. It was not until 1875 that apparatus developed embodying the fundamental features of the machine of today. Of the forms which appeared during this early period, the Lowe type, due to inherent correctness of its early principles and its later developments, has survived out of an intense and interesting competition for a place in the industry.

As soon as there was any fairly workable type of water gas equipment, there sprang up a rivalry as early as 1860 over the two kinds of gas. The records show an interesting story between the advocates of coal gas, the safe, reliable and established method on one hand, and on the other, water gas, the new, uncertain and extremely dangerous product. Water gas was being exploited at a lower cost and with considerable discomfort and disorganization to the then well-established coal gas crowd and with widely heralded danger to the life and security of individual consumers.

General History

Water gas interest is evidenced by frequent reviews. In 1827 Mathews' gas story includes anecdotes of spirits and vapors in deep wells, mines, etc. Chambers, 1878; Morton, 1879, and Shelton, 1889, reviewed characteristic developments up to their time. In 1909 Norton provided an illustrated review with discussion of 57 types of apparatus. Cortelyou commented on the change of New York City gas rate from $10 in 1826 to 80 cents in 1906. Evans reviewed later developments up to 1906 and Cooke in Johns Hopkins Alumni Magazine discusses the recent gas development in Baltimore as compared to the previous century record and describes their three house plant sending out 60,000 M. per day.

Periods

The stories of reviewers and other records of development indicate a possible division into five or six periods covering water gas history and the evolution of the water gas machine.

First Period—Before 1823—Water gas only a theoretical consideration.

Second Period—1823 to 1859—Pioneering and experimental work.

Third Period—1859 to 1875—Retort Processes for Water Gas.

Fourth Period—1875 to 1892—Life of the Lowe Patents.

Fifth Period—1892 to 1915—Detail developments up to Automatic Operation.

Sixth Period—1915 to date—Automatic Operation and Recent Developments.

First Period

In this period practically nothing was accomplished. Fontana in 1770 calls attention to the reaction which takes place between steam and incandescent carbon. In other experiments, hydrogen gas is obtained by passing steam through a heated pipe and later experimental water gas by using some charcoal in the heated pipe.

Second Period

In the second period there was considerable activity in patents and experimental work but not much accomplished in the establishment of definite practical types.

Starting with Crane in 1823, some sixty patents were issued until 1859.

In 1824, Ibbitson while keeping the process all in one apparatus had a separate chamber which supplied the heat for the water gas reaction through the chamber walls. While self-contained, this process was inherently one in which the generator heat was supplied from an external source.

Donovan (1830) first successfully supplied water gas commercially by passing steam over red hot coke or charcoal and carburetting with hydrocarbons. This marks the beginning of carburetted water gas.

In 1832 and 1834, Lowe and Jobard made water gas in a generator charged with hot coke and further heated by natural draft. The gas was later carburetted. It is interesting to note the variety of materials used as an enricher during this perid—tar, turpentine, rosin, petroleum, asphaltum, bitumen, naphtha, vegetable oils, animal oils, tallow or caoutchouc.

In 1845 a blast of steam in connection with air was proposed. The nitrogen was left in the gas. This is the first occurrence of blast to generate heat in the same chamber into which steam was forced to make water gas.

This was followed in 1849 by the work of Gillard, a French chemist, who devised a method of making water gas by blowing and steaming a cupola, similar to a cupola used in foundry practice. This product was found to be impregnated with hydrocarbon and carbonic acid.

None of the apparatus during this period seems to have established itself or taken any permanent commercial foothold.

Third Period

In 1854 Aubin had a development for making gas by first making charcoal from wood in a retort and then

* Read before nineteenth annual meeting, Canadian Gas Association, Montreal, Canada, July 9th and 10th, 1926.

treating it with water and enriching with rosin. This does not show any growth, but there was much agitation in regard to water gas at this time and very considerable skepticism. Popular articles at that time are very interesting and discredit the figures submitted to show that water gas might be cheaper than coal. Comparative costs below show water gas at 50 cents per thousand as against coal gas at 52 cents.

Cost of Water Gas

Thirty-five pounds of rosin to carburet 1,000 feet of water gas at 1 cent per pound equals 35 cents. Add for fuel 15 cents, making a total cost of the water gas material equals 50 cents per thousand.

Cost of Coal Gas

Bituminous coal at $6.00 for 2,240 pounds, yielding 4.463 cu. ft. per pound of coal, or 10,371 cu. ft. for 2,240 pounds. Cost of coal for coal gas is 57¾ cents per pound. From this deduct 10 per cent credit on the amount of coke sold, is 5.77, making the net cost of gas 52 cents per thousand pounds.

The clinching argument convenient, if not convicing, was that if the rosin were generally adopted for making water gas, the price would rise and make water gas much more expensive than coal gas. But increasing the consumption of coal gas would tend to increase mining of coal and so cheapen the price. One contributor goes so far as to state that he does not think it possible to manufacture water gas for less than five times the cost of coal gas. He admits that water has done a great deal for navigation; it was not, however, in his opinion, responsible for the beautiful light obtained at Wilmington, where a demonstration had been made, but was rather due to the rosin and charcoal used. Another commenter ridicules the idea in this manner: "They are making gas in such and such a place of water, or air, or moonshine, or something else which costs nothing and sells for less than the paper on which the bill was made."

Saunders' Retort Process

Despite this attitude, in 1860 we find the beginning of some commercial development. The first to gain foothold was the Saunders Retort Process in which steam was passed downward through a bootleg shaped vertical externally heated retort with melted rosin run in at the same time. The gas was not well fixed. The Gywnne or Allan-Harris quickly followed this start and was more successful due to the provision for better fixing the enricher in the secondary set of separately heated retorts The operation of these retort processes extended over a period from 1860 to about 1875 and the fuel results during that period ran from 60 to 70 lbs. of fuel per thousand feet of gas made and either six gallons of oil or 50 lbs. of rosin.

Towards the end of this period there developed the Tessie Motay and Wilkinson proces. These were the first practical types in which fuel used for dissociating steam, was heated intermittently by internal combustion instead of being heated constantly by external means. The Motay and Wilkinson generators produced blue gas. This went to an enriching chamber in which naphtha vapors were picked up and then passed thru an externally fired fixing chamber.

Fourth Period

It was not a great step from these to the first Lowe type machine, and yet it seems to have been a distinctive one, producing the essential of our modern Lowe apparatus. Instead of using a separate externally fired retort to fix the enricher, Lowe devised a fixing chamber auxiliary to the generator, which could be heated by secondary internal combustion from the generator fuel bed. One fuel bed for internally heating both generator and superheater.

This period spreads over approximately the life of the Lowe patents. It was now that water gas took a foothold and by 1882 about 70 per cent of the country was water gas. In 1889, A. C. Humphreys before the British association stated that three hundred out of 1150 gas works in America, were water gas, whereas there had been practically none in 1874.

In 1875 a Lowe machine showed total make of gas of 3,745,000 cu. ft. of 18 to 20 candle power gas, using
62,300 lbs. of boiler coal = 16.7 lbs. per thousand.
190,587 lbs. of generator fuel = 52 lbs. per thousand.
11,743 gal. of petroleum = 3.15 gals. per thousand.
Coal and oil figures were later reviewed and corrected to 70.3 pounds and 3¼ gals. per thousand.

Results on Gwynne-Harris Machines

About the same time reports on the Gwynne-Harris machine gave the following results:

Gas made 1,317 M. of 17.23 candle power, .64 specific gravity.

Materials used per thousand cu. ft. of gas:
Coal charged into retort, 27 lbs. to 28 lbs.
Oil for enricher, 4.8 to 5 gal.
External heating of coal and oil retorts, 57 lbs.
Fuel for boiler and superheater, 17 lbs.
(Calculated from miscellaneous data.)

That the water gas progress during this period was considerably encroaching on the coal gas field is shown by very great activity against water gas in general. This is well illustrated by the experiences of a gentleman from Toronto who was vigorously challenged at a meeting of the gas association, when submitting data he had gotten for his company from another plant's operation:

14 men (7 per shift) running
8 sets making 600,000 cu. ft. per day, requiring
50 lbs. of coal, and
4½ gals of oil.

This gentleman returned to the meeting a year later, in 1879, after his company had purchased and installed two sets in his plant. He advised the Lowe process, a commercially successful apparatus with rapid progress since its inception five years before and that eighteen plants had been installed and were operating satisfactorily. His average results for seven months were 4½ gallons of petrolum, 58.56 pounds of anthracite, and .26 bushels of boiler fuel. Seven men were required for 24 hours' operation and 148,000 cu. ft. of 16 candle power gas were made, using two five-foot generators.

Considerable Skepticism Over Process

There was still considerable skepticism and antagonism towards this newly-developed process. The keen-

(Continued on page 40)

Self-Contained Unit or Separate Systems

Factors governing choice for domestic refrigeration

O. T. Knight

Chicago, Ill.

WHAT are the several considerations which determine the proper answer to this question.

1. The satisfaction, from all standpoints, to the consumer.
2. The broadness of the field for sales exploitation.
3. The cost and facility of manufacturing and installation.

The first consideration is the one of prime importance, for without satisfied consumers the other questions do not exist.

Refrigerators are usually placed in the kitchen or in an adjoining pantry. In either one of these locations space is usually at a premium, and a housewife will agree that the place for machinery is not in the kitchen.

In case servicing of the machine is required, it is necessary to use tools of various kinds; this means more or less dirt, frequently at the most inconvenient time, which is always an objection from the standpoint of the housewife.

Objections To Self-Contained Unit

In the case of electrically operated, self-contained units, the noise is so objectionable that it often determines the purchase or non-purchase of a particular machine.

In the case of gas operated, self-contained units, the heat generated in the kitchen cannot fail to be objectionable to the housewife, and it seems illogical and contrary to all common sense to place a source of heat in close proximity to a refrigerator which it is desired to keep cold. What housewife wants water, sewer, gas, and flue pipes in her kitchen running to her refrigerator, all of which are necessary if a self-contained, gas operated outfit is installed? If the machine is not a component part of the refrigerator, all this piping is in the basement and only two inoffensive, unseen, small pipes come up behind the refrigerator and enter through the back.

The field for the sale of a self-contained unit is certainly much narrower than the field where the machine is not a component part of the refrigerator.

A self-contained unit is necessarily of certain fixed over-all dimensions. This limits the sale of such equipments in old buildings to locations only where the space occupied by the refrigerator is sufficiently large to accommodate the self-contained unit. The greater percentage of old buildings are already equipped with refrigerators of some size and kind, and if a self-contained unit is installed it means that the present refrigerator, irrespective of the condition must be junked or otherwise disposed of. This means very strong sales resistance in every old building.

Basement Installation

If the machine is separate from the refrigerator, it can be installed in the basement, out of the way, and connected to the customer's present refrigerator, thus making every refrigerator at present in use a prospect for the sale of mechanical refrigeration.

If the prospective sale is in a building which houses from two to six families, and therefore two to six refrigerators are to be taken care of, it will require the installation of a self-contained unit with all the necessary pipe connections in each of the several kitchens; whereas, if the machine is not a component part of the refrigerator, one unit of sufficient capacity installed in the basement will take care of all the refrigerators. This reduces any necessary attention or servicing required to one-sixth of that necessary if six individual machines are installed, and this servicing is done in the basement, thereby avoiding all the dirt and mess so objectionable to the housewife, whereas the servicing on the self-contained unit would necessarily have to be done in the individual kitchens.

If a building contains any number of refrigerators above six, several machines, each handling six boxes, can be installed or, if desired, larger machines, installed in the basement and handling any number of refrigerators, can be manufactured.

Brine Circulating Systems

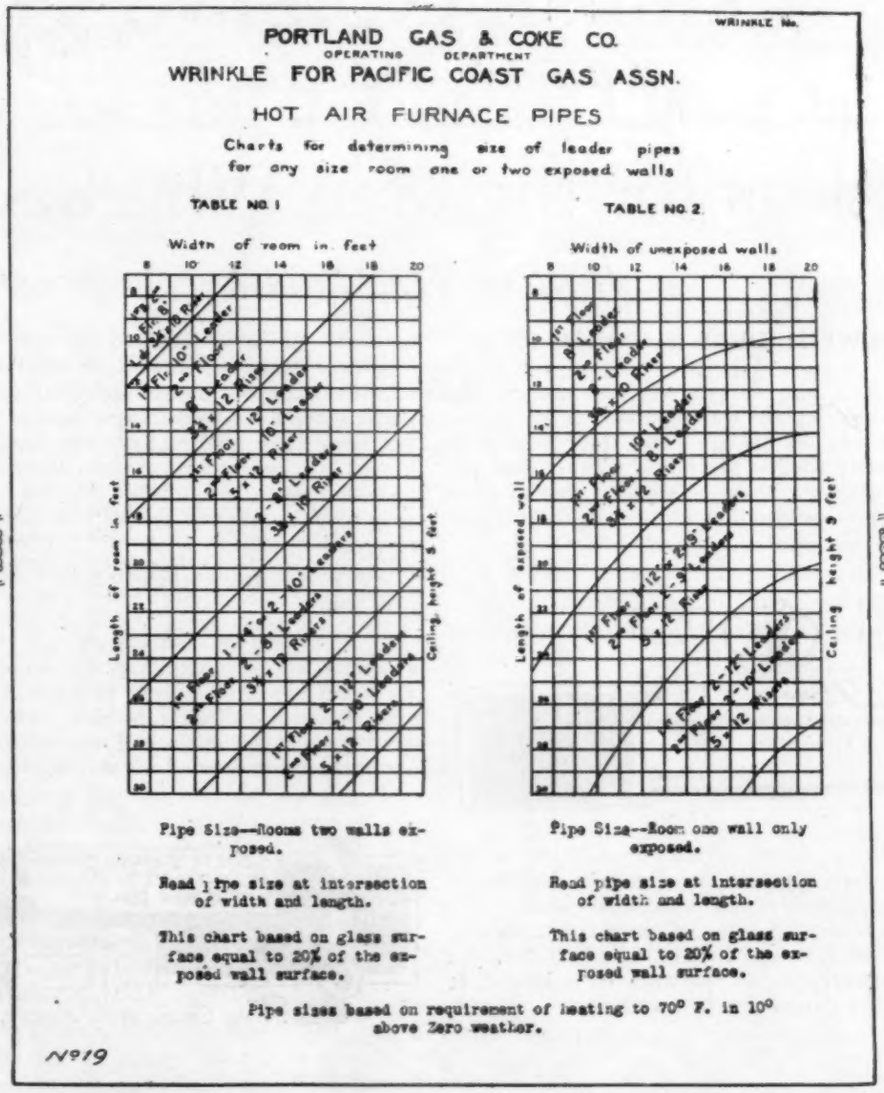
The tendency in large buildings of great height and containing many apartments is not to install a multitude of self-contained units, but to equip the building with a brine circulating system. In this system the brine is cooled in the basement by one large machine and pumped throughout the building.

There are several installations of individual, self-contained units in Chicago in large apartment buildings where it is now the desire of the owners to replace the individual units with larger machines installed in the basement, each handling a number of boxes. These buildings, however, were originally designed for individual units and to replace these individual units with installation in the basement is expensive and in some cases impractical. In one case in point, an apartment building containing 72 individual units, the owner is willing to go to any expense to replace them with machines installed in the basement if a practical way can be worked out to do so.

Many sales will be lost to the self-contained unit due to the fact that a particular size being manu-

(Continued on page 38)

GAS WRINKLES


WRINKLE No.
PORTLAND GAS & COKE CO.
OPERATING DEPARTMENT
WRINKLE FOR PACIFIC COAST GAS ASSN.
HOT AIR FURNACE PIPES
Charts for determining size of leader pipes for any size room one or two exposed walls
TABLE NO. 1
Width of room in feet
Length of room in feet
Ceiling height 8 feet
Pipe Size--Rooms two walls exposed.
Read pipe size at intersection of width and length.
This chart based on glass surface equal to 20% of the exposed wall surface.
TABLE NO. 2
Width of unexposed walls
Length of exposed wall
Ceiling height 8 feet
Pipe Size--Room one wall only exposed.
Read pipe size at intersection of width and length.
This chart based on glass surface equal to 20% of the exposed wall surface.
Pipe sizes based on requirement of heating to 70° F. in 10° above Zero weather.
N°19

GAS EQUIPMENT TO BE DEMONSTRATED IN THIRTY-SIX HOMES

With the object of educating the public to the benefits of adequate gas equipment in the home, arrangements have been completed for the erection of thirty-six model demonstration homes in 1926. This movement is being sponsored by the American Gas Association, which has joined with other associations in a co-operative campaign to build, demonstrate and call the public's attention to the latest developments in the home building field.

Houses are to be erected in twenty-eight of the larger cities as follows: Boston, 2; New York, 3; Philadelphia, 2; Baltimore, 1; Washington, D. C., 1; Atlanta, 2; Miami, 1; Buffalo, 1; Pittsburgh, 1; Detroit, 1; Cleveland, 1; Louisville, 1; Memphis, 1; New Orleans, 1; Houston, 1; Chicago, 3; St. Louis, 1; Fort Worth, 1; Minneapolis, 1; Des Moines, 1; Omaha, 1; Kansas City, 1; Denver, 1; Salt Lake City, 1; Seattle, 1; Portland, 1; San Francisco, 2; Los Angeles, 1.

The plans and specifications for the homes have been approved by engineers of the American Gas Association, who have worked in co-operation with leading architects and building specialists. The lay-out of piping and flues, the location of gas outlets and other details have been carefully drawn to conform to modern practice.

These homes are to be extensively advertised to the public. Every effort will be made to interest prospective and present home owners throughout the country.

GAS MERCHANDISING

Domestic – Industrial

Ideas for the Man Who Sells

William H. Matlack

A MAN WITH IDEAS IS WORTH IT

NOT so long ago a man who sat around and devised sales plans was regarded as worthless, but "times do change" and now men with ideas are eagerly sought after and when roped and tied they are paid generous salaries to plan and put into operation sales building ideas. Just the other

day the principal of a small print shop told the writer that he paid his copy and lay-out man $6,000 per year and that he was worth more.

If you have men with ideas let them try them out. They all may not be productive or profitable, yet you can at least listen to the man with ideas. It takes ideas to sell merchandise and gas.

¤ ¤ ¤ ¤

IS IT TRUE THAT THE GAS COMPANY WILL NOT PAY

NOT long ago we were talking to a former gas man who knew his gas. He was a man who had done things in construction, operation and in the merchandising end of the business—a systematic, hard studious worker, who had made a record with every company he had ever been employed by.

We were surprised to learn that he was not in the gas business and asked the reason. At first he hedged the question by saying, "Well I may get back," and finally; "To be honest I wish I could get back into the game. I do not seem to be able to do it though. I cannot find anyone who will pay me a salary, or a salary and commission for that matter, sufficient to enable me to provide a good living for myself and family. I have talked to two or three gas men in the past year regarding employment, and while they have received me and been courteous they all wound up by saying, 'Well you see we cannot afford to employ a man of your type now, but we will be glad to have you keep in touch with us for we expect to get into things in a big way soon and when we go after the home appliance business like the electric people, we can afford to have a man like you.'

"At first I rather believed this, but now I think it is 'bunk.'

"Now to cite another instance; I was told about a gas man who was experiencing some difficulty with a certain phase of selling problem and it was suggested that I call on this man. This I did and he went over his problem and we talked about my experience and it seemed for a time that we would get

They Come Well Recommended but-

together. He even looked up my references and a date was set for the final details. Nothing had been said regarding compensation. When the day arrived and I called he seemed very happy and sure that I could work out his problem. My hopes went up and then came down when he said, 'Now what do you expect in the way of salary?'

"This mentioned and all was over and that is why I am not employed by a gas company. Sometime later I met the man who had told me about the position and he said the salesmanager had said to him that I had too many ideas (can you beat it?), that what he wanted was a settled man, a man who would follow company precedent and have fewer innovations to offer that might prove costly. The truth of the matter is that this sales manager wanted a man like himself, a rule-of-thumb man, a man who would tune-in on his time worn practices and who would work cheap."

As The Journal Views It

THE GAS MAN AT THE CONVENTION

The gas industry is fortunate in having a comparatively large number of State and District Associations besides a very well organized and excellent National Association. All of these associations hold meetings during the year and these culminate in October with the meeting of the National Association.

Many gas men attend these meetings. Many papers are read there by gas men and also by outsiders. Many entertainment features enliven these gatherings. There is scarcely a month in the year that does not have one or more meetings scheduled for it.

Just a cursory consideration of these facts would lead to the conclusion that a rather large amount of time and money is spent in these meetings. And this money and this time are consumed at the expense of the gas companies that make up the gas industry. It is, therefore, not surprising that the thought should come to mind as to just what these gas companies require of their men who attend the meetings. In accepting the invitation to be sent to a gas convention, what responsibility does the gas man assume and what does he owe his company who sends him there?

There is no question at all that the gas man, who wants earnestly to derive some benefit or other from his attendance at a gas convention, can do so. It might almost be said that attending the gas meeting is like attending a university or college course. A man can learn much by listening to the addresses and papers that are read, by asking questions and entering into the discussions. This is the business side of the meeting, which corresponds very closely in fact to the academic side of the college attendance.

But there is also the spiritual side to be considered. A man who attends the conventions and who "does them" in proper fashion, not only gains from listening to the papers but also from the intercourse and contact with his fellows. Thus also does the college man gain from what is so often called "college life," meaning the social influence exerted by his college friends and acquaintances.

The man who is sent to conventions is expected to gain as much as possible from them. That is why he is given the opportunity to attend them and in fulfilling this purpose he inevitable benefits himself. So it is by no means a selfish aim that actuates the gas company to send him to these meetings. It is simply the desire on the part of his executives to see that their employees are given the opportunity of acquiring all the information that they possibly can and of making friends with other gas men whose interests lie along the same lines. Many a difficulty or problem has been helped along to a solution, if not eventually solved, by the gas man asking pertinent questions at convention meetings.

The duty of the gas man who attends the convention is evident. It is a duty both to himself and to the industry he represents. He must make the most of his opportunity, be ready always to enter into the discussions and take an active part in the meetings, to be prepared with questions as well as answers to the questions of others. In other words, give the most of his knowledge and ability and to make best use of his inherent social propensities to better himself and thereby the company that employs him to the greater progress and aggrandizement of the gas industry as a whole.

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THE READINESS TO SERVE CHARGE

There has been a great deal of discussion and controversy over the so-called readiness-to-serve charge. The gas company in a number of cases has tried to educate its customers to understand this charge and to see the advantage of it to those who use gas regularly and in fairly large amounts. The reaction has been different according to local conditions. Sometimes the customer of the gas company clearly recognized the validity of this charge and the real advantage that it had for the average gas consumer who used about 3,000 to 4,000 cubic feet of gas per month. On the other hand, there have been cases where consumers have not been able to understand the economics of the readiness-to-serve charge and have not really been willing to try to understand it, with the result that they have risen in unjust anger and condemned those responsible for it.

The psychology of habit is interesting. As long as one is accustomed to a certain procedure or to performing a certain duty, he does not think it unreasonable. But just as soon as something new is proposed that is exactly similar to what he is doing in some other way, he objects strenuously and generally without making an analysis arrives at the conclusion that he is being

imposed upon. This is the real condition of the readiness-to-serve charge at the present day.

A service charge is not a new thing by any means. There are similar charges which people pay every day without realizing it. Mr. C. S. Reed, Chairman of the Rate Structure Committee of the American Gas Association, has pointed out a number of service charges which people pay without objection. For example, in many cities there is an operating charge as well as a waiting charge for him who takes a taxicab. The same is true of an attorney when he accepts a new case. He gets a retainer fee before he does any work at all, and there is no objection to this fee for it is realized that the attorney is always on hand for emergency and this retainer fee is his payment for being thus available. This applies as well to the consulting engineer and the consulting chemist. Many examples may be cited.

People do not object to these charges because they are accustomed to them and the reason why the majority of people object to the service charge of the gas company is simply because it is something new to them and they are not used to it. They do not stop to find out why the charge is made and what advantage it has for them but immediately conclude that they are being imposed upon. The lesson this teaches is very clear. The gas company should not give up its attempts to educate its customers to understand the real character and economic significance the readiness-to-serve charge. It is amply justified from every standpoint. Moreover, a great deal depends on it. There is really no question but that the gas industry would be better off with a service charge which its customers would understand and appreciate to be absolutely fair to them and to the industry that serves them with gas.

Gas Ranges for Apartments

Active competition with electric ranges

John H. Hartog

Manager New Business Department Portland Gas & Coke Company

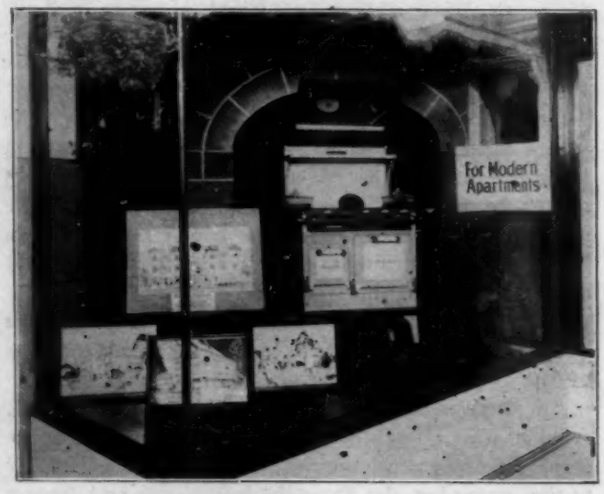
THE above shows a window display in which the modern range is emphasized as being just the thing for modern apartments.

In this city, with the very active competition of two electric companies, it had become the habit of installing almost nothing but electric ranges in modern apartments. The advent of the improved Smoothtop gave the Portland Gas & Coke Company a chance to compete for looks and efficiency. Of course as regards desirability, for speed especially, there never was any comparison between the modern gas range and the electric range.

As is shown in the picture, the window contained the designs of some recently erected apartment buildings, all of which had installed these ranges.

By giving the buildings. the architects and the contractors free advertising in the show window, it naturally appealed to these owners, builders or architects and drew the attention of others in these lines of occupation. In this way we tied up the gas range with the apartment and at the time created goodwill and appreciation.

It has been customary with us of late to get cuts of striking new New York apartment buildings which are installing gas ranges and reproduce these in our local papers so that the people may learn that there is something besides an electric range for a modern and high-toned apartment building. Of course the difference between those gigantic edifices in New York and the more modest and humble apart-



ment buildings in a city like Portland is striking. All the more reason for the apartment owner in the smaller city, when he compares the size and appearance of his own apartment with the tremendous undertakings in New York City, to exclaim from the house top: "Me too for a gas range!"

The small kitchens of most apartments here necessitated the insulating of ovens and securing a range with the largest capacity for the space available.

PROGRESS IN GAS TECHNOLOGY
Domestic and Foreign

METHANOL FROM WATER GAS

A MIXTURE of water gas of normal composition with gases from the distillation of coal and like fuel, when passed over a catalyst adapted to form methyl alcohol from carbon monoxide and hydrogen, yields a product consisting of methyl alcohol and liquid hydrocarbons. The mixture of water gas and say illuminating gas or coke oven gas in equal quantities is circulated at a pressure of 150-250 atmospheres over a zinc oxide-chromium oxide catalyst maintained at a temperature of 300° C. Pressures of 800-1000 atmospheres are also mentioned. The catalyst is prepared by reducing agglomerated basic chromate of zinc. The portion of the gas entering into the reaction is periodically replaced by fresh gas mixture.

The condensed product, when diluted with water, separates into two layers the upper consisting of hydrocarbons and the lower of methanol mixed with water; the undiluted product may be used without further treatment as a fuel. The residual gas is allowed to expand in order to liquify the methane, which may then be partially burnt with oxygen to produce a mixture of carbon monoxide and hydrogen for addition to the reaction mixture. The hydrogen still remaining in the non-liquified residual gas may be separated by known means and also added to the reaction mixture. By these means it is possible to reduce or even eliminate the use of water gas and to operate only with fuel distillation gas when the process has been started. (British Patent No. 247,932.)

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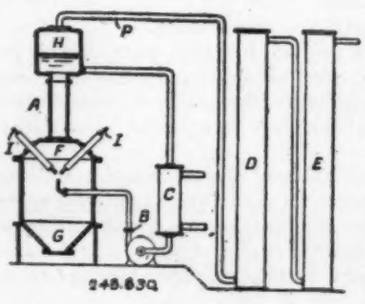
ACCIDENTS WITH GAS APPLIANCES

THE cause of accidents with gas appliances is the subject of Technological Paper No. 303, published by the Bureau of Standards. This paper describes an investigation conducted in Baltimore in co-operation with the Baltimore Health Department, the United States Public Health Service and the Consolidated Gas Light & Power Company of Baltimore. A number of tests were carried out with defective appliances, as well as with those in ordinary use, to determine just why accidents result when they are employed. These tests are explained in detail in the publication and illustrations are also shown which indicate the manner in which these gas-heated appliances were faultily operated. A few tests of appliances were also made with various pressures of gas.

In conclusion, it is claimed that accidents from carbon monoxide are largely due to improperly designed appliances, while on the other hand, a large percentage of accidents are primarily caused by carelessness on the part of uninformed persons.

OIL GAS

A GAS suitable for lighting and heating purposes, which is rich in acetylene, is obtained by decomposing hydrocarbon and like oils by means of a submerged arc, the oil being maintained at a low temperature by rapid circulation through a refrigerating device; at the same time a good quality smoke black is produced. Substances that may be treated according to the present process are tars, crude oils as obtained in the distillation of coal, brown coal, peat or bituminous shales, and heavy oils in general; any sulphur and nitrogen present as impurities in the oil, etc., are converted into sulphuretted hydrogen and hydrocyanic acid, and can be separated from the gases by chemical treatment. The acetylene may be separated from the admixed gases—paraffins and hydrogen—and used for obtaining benzol, acetic aldehyde, cyanides, etc.; or it may be so used without separation.



The furnace A is constructed entirely of metal, the actual splitting of the oil, etc., taking place in a chamber, F, provided with insulated electrodes, I, of carbon or metal, if desired, arranged for separate cooling, and which may be hollow so as to permit the introduction of gaseous or liquid substances for the purpose of enriching the gaseous product formed in the arc. The liquid operated on is withdrawn from the upper chamber, H, by means of a pump, B, being passed through a water-cooled refrigerator, C. The gases leaving the chamber, H, are taken by a pipe, P, to purifiers, D. E. The smoke black collects in the lower part, G, of the decomposition chamber, F, and can be removed without interfering with the working of the apparatus. British Patent No. 248,830.

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DISTILLATION OF (BENZOL) WASH OIL

BENZENE and toluene are recovered from crude light oil separated from wash oil, by heating the oil by means of wash oil flowing out of the washing apparatus, and xylene and solvent naphtha are recovered by treating it with steam in the same or in another extraction apparatus. The residual oil is returned to the supply of wash oil, to prevent it from thickening. (German patent 417,340.)

SELF-CONTAINED UNIT OR SEPARATE SYSTEMS

(Continued from page 32)

factured does not meet a prospective customer's requirements, not from the "space occupied" standpoint, but from the standpoint of "cubical food storage capacity."

Tastes of Customers

To be able to meet a reasonable percentage of customer's requirements, which range from 50-pound ice capacity to 350-pound, standard self-contained units would have to be manufactured in a number of different sizes. It will also be found that many customers desire certain finishes to match woodwork, some prefer porcelain exterior, others wood; a number have definite ideas on insulation; and no matter what the construction of the refrigerator of a self-contained unit may be, there will be many customers whose desires it will not meet. These may appear to be minor considerations, but are all points of sales resistance which have been encountered by manufacturers of self-contained units.

If the machine is not an integral part of the refrigerator, any box the customer may have, or any box of any of the many refrigerator manufacturers on the market which he may fancy, can be satisfactorily refrigerated.

Apparently the sales field for the self-contained unit is largely limited to new buildings where the proper provision in the design of the building is made to accommodate them or to individual cases in old buildings where a new refrigerator has to be purchased.

From a manufacturing standpoint it is unquestionably desirable to produce a self-contained complete unit that can be standardized and which can be produced in quantity, thus making a lower cost possible.

An Example

To see the result of such a policy it is only necessary to study the history of the oldest and largest electrical manufacturers of domestic refrigerating machines. They started with one self-contained unit. Today they are advertising six different sizes of self-contained units. This number is necessary to meet the prospective customer's demands for cubical content of food storage space. Even these six different units cover only a portion of the field, and it was found necessary, in order to meet demands, to produce units which could be installed separate from the refrigerator, thereby being able to utilize a customer's present refrigerator. In order to get away from an individual machine for each refrigerator, this manufacturer is now perfecting one machine to be installed in the basement and to supply up to six refrigerators.

When it comes to installing a gas domestic refrigerating equipment, on first thought it may appear simpler to install a self-contained unit, but in every installation it will be necessary to bring the water, sewer, and gas piping to the refrigerator. This would generally mean long lines in the basement which must come up through the floor. The connection of these lines to the refrigerator will have to be made in more or less cramped quarters. In addition, an unsightly flue pipe will usually have to be run around the kitchen walls and connected to the gas range flue.

If the machine is separate from the refrigerator, it is installed in the basement in the most favorable location for gas, water, sewer, and flue, irrespective of where the refrigerator may be located. In these days when gas is fairly universally used for water heating, the machine can properly be placed near the water heater; thus all the necessary connections are very short and are made under favorable circumstances, where there is plenty of working room. It is an easy matter to connect the machine to the refrigerator, irrespective of its location or distance from the machine, by means of two small pipes as big as one's finger. From the standpoint of the housewife, it is very advantageous to confine all the dirt and mess to the basement and not have it in her kitchen.

Conclusion

In conclusion, there are no apparent advantages in a self-contained unit other than a possible manufacturing economy. From a sales standpoint the field for the self-contained gas-fired unit is very limited, and present competitive conditions in that field seriously limit the possibilities of successful exploitation of such a unit.

This is in strong contrast to the field for the gas-fired machine separate from the box. Such a machine manufactured in several different sizes will fulfill every domestic requirement and possesses so many advantageous features over competitive machines that it resolves itself entirely into a question of quantity production. By the proper exploitation of such a machine, the gas industry can become a large factor, and eventually the controlling factor, in the enormous field of domestic refrigeration, and with further development it can occupy a like strong position in the commercial field.

PUBLIC UTILITIES—A HANDBOOK

This is the title of a publication that has been issued by the Public Service Information Committee of Pennsylvania. It is a booklet of twenty-three pages dealing with some of the most important characteristics and problems of public relations. These subjects are described briefly but to the point and form very interesting reading matter not only to gas men but also to the public in general.

The booklet discusses such subjects as functions of the utilities, the relationship to the community and to national prosperity, investment in utility services, earnings, utilities as taxpayers, the necessity for their growth, fixing of rates for service, state commission regulation and other pertinent matters.

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 127

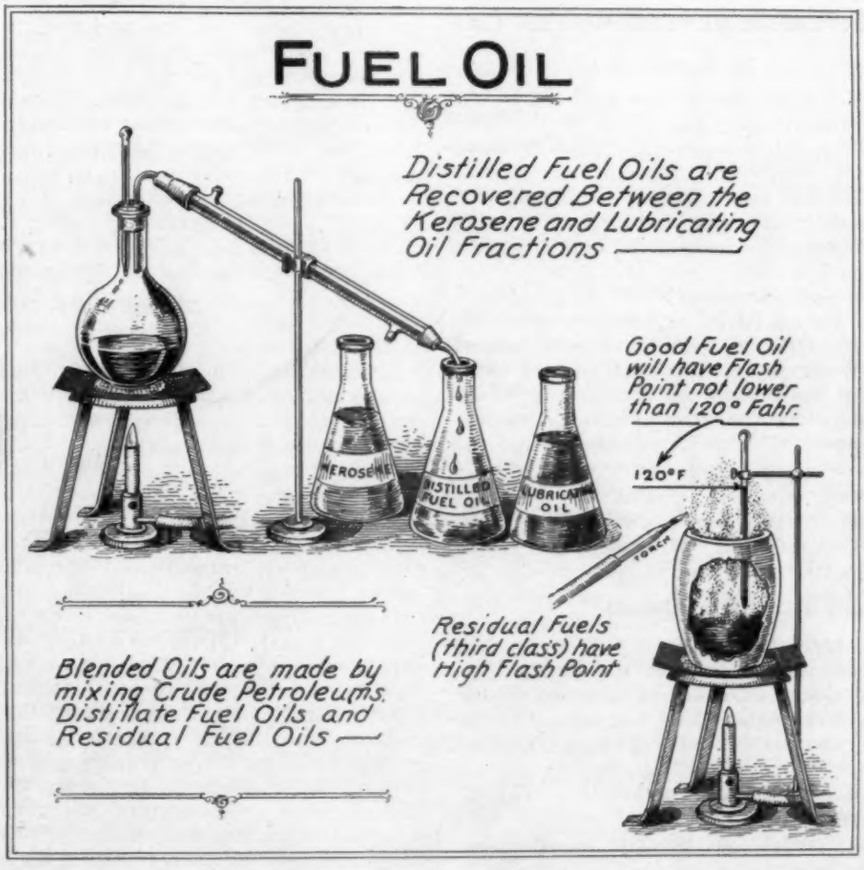
Combustion

Blended Fuel Oils

The blended fuel oils, as the name indicates, are simply mixtures in various proportions of the three types of fuel oils described above. Blending is necessary for many reasons particularly to overcome high viscosity of the residual fuel oils, to produce composite oils which do not have so low a flash-point and hence are not so dangerous to use for domestic and industrial purposes and also to reduce the amount of water and salt present in the blended fuel.

Distilled Fuel Oils

This is the class of fuel oils that are obtained during the distillation process. The oils consist of the hydrocarbons which distill over between the kerosenes and lubricating oils. They do not contain any heavy residuals nor salt, which is nearly always found admixed with crude petroleum. These light or distilled fuel oils also contain the gas oil which may be separated from them and sold for gas making purposes. These distillates are obtained mainly in this country from petroleums that are mined in mid-continent and eastern oil fields.


FUEL OIL
Distilled Fuel Oils are Recovered Between the Kerosene and Lubricating Oil Fractions
Good Fuel Oil will have Flash Point not lower than 120° Fahr.
120°F
KEROSENE
DISTILLED FUEL OIL
LUBRICATING OIL
TORCH
Residual Fuels (third class) have High Flash Point
Blended Oils are made by mixing Crude Petroleums, Distillate Fuel Oils and Residual Fuel Oils

Residual Fuel Oils

The next type of fuel oils are the residuals. These are the oils that are left behind in the still after the more valuable volatile hydrocarbons have been removed by distillation. Such fuel oils are rather viscous liquids that make up for their difficulty in handling, due to their high viscosity, in being absolutely safe. The flashpoint of such oils, that is the point at which their vapors will ignite, is increased due to the removal of the gasoline and other light hydrocarbons which have low flash points. Furthermore, the distillation results in the removal of the water that is contained in the petroleum and in this connection the residual fuel oils have an advantage over the distilled fuel oils for the latter are very apt to contain water. If there is any water in the residual fuel it comes from leaky steam coils, rain and the like. The residual fuel oils are obtained mostly in this country from the fuel oils that are mined in California, Mexico, Texas and parts of Oklahoma.

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THE STORY OF CARBURETTED WATER GAS

(Continued from page 31)

ness of feeling on this subject is fully disclosed by the record of discussions in these meetings. A year later this gentleman a second time returned from Toronto with still more conclusive data. In this second year additional machines had been installed so that 681,000 cu. ft. of 16 candle power gas was made, using 4¼ gallons of oil, 59 pounds of anthracite and 11 pounds of boiler fuel.

The first double superheater or enlarged goose-neck set, was built at Coney Island in 1882. One of the reasons offered for making a double superheater set was to adapt the water gas machine for the use of lower superheaters to be installed in the low roof buildings where coal gas equipment would be replaced. These machines were operated on 5 min. blow and a 7 min. run and results were 36.7 pounds of fuel per thousand, 4 gallons of oil and 23¼ candle power gas. The make per square foot per thousand per day had advanced during this period from the early figures of about 11,000 per sq. ft. for 24 hours to 16,000.

Many Patents on Details

Patents were largely for details, a few in the 70's of non-important matters. In 1882 the Springer set appeared, Shields, Granger and others proposed modifications, none of which seem to have had any important influence on the development of the present type of machine.

In 1884 English submitted a prototype of a Williamson set which had the first horizontal partition solid wall with external connections between the generator and carburetting chambers.

In 1885 Springer showed a special arrangement for using down steam only and a unique design of water cooled valve.

In 1886 Franklin Institute awarded Lowe a gold medal for the most important contribution to science.

Among the questions of design raised during this period and not entirely settled, were that of pre-heating air and steam, the working out of a satisfactory oil system, the arrangement of up and down run for the gas and preliminary attempts at interlocking for safety.

Fifth Period

This is a period in which the Lowe machine fundamentally was not much modified. There were periods of activity in patents and design of details brought about probably by the expiration of the Lowe patents and the efforts of competitors. There was an array of changes, oil sprays, up and down run connections, oil heaters, cinder pockets, hot valves, vaporizing chambers, damper valves, safety interlocks for blast and stack valve, special oil heater, a washer box design which is a prototype of the present double inlet tar batter in that two water seals were used instead of a single dip pipe, safety relief in the blast lines, steam jet substitute for the hot valve, various types of valve nests with interlocking safety levers and special arrangements of combustion areas in an attempt to avoid clinkering.

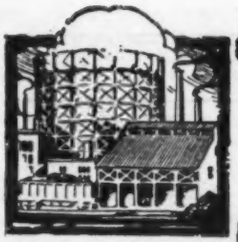
The probable reason for so many changes in detail parts was a drive for capacity and efficiency on this fixed type of apparatus. Tendencies were to increase the blast, shorten the blow and run, increase the depth of fuel beds, enlarge connections in the machine. This tended to increase the make per sq. ft. and cut down the oil and fuel per thousand. It was the period of gradual development of the hand-operated three shell Lowe type water gas machine, up to the limit of manual operation. The make per sq. ft. per day was around 30 M. to 35 M. at the beginning of this period, increased to 38 M. to 45 M. towards the end. Operating cycles changed from as high as 6 and 7 min. blows and 8 and 9 min. runs to probably 3 and 4 min. runs and blows.

Sixth Period

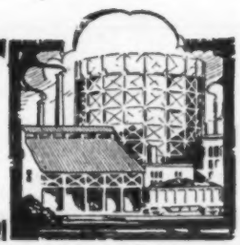
This comprises the advance in water gas apparatus, due largely to the improvements in auxiliaries and secondary apparatus, such as automatic controls, metering devices, larger passageways, waste heat boilers, heat accumulation, special operating cycles, fuel and clinker handling equipment, etc., rather than details of the machine itself, or any fundamental change.

The principal patents of this period reflect pretty clearly the type of development. There are seven or eight patents on automatic and interlocking mechanism; one or two for hydraulic operating methods, and four or five on modifications of the Lowe cycle of the three previous periods. This has brought us to the present-day automatically controlled, high speed machine, with high pressure blowers, exhaust steam, steam and air regulators, automatic chargers, waste heat boilers, accumulators and efficient sprays. We find the apparatus arranged and placed in generating houses in new and better relative positions for observation to conserve manual labor and minimize lost time in clinkering, charging, repairing, etc. More recently these sets are being operated to energy conserving cycles that are rapidly demonstrating increased economies. This is probably also the period of soft coal development, but so far this seems to be a matter of process or method rather than as yet any definitely crystallized type of apparatus.

(Editor's Note:—The second half of Mr. Stone's interesting article will appear in the next issue.)



NEWS OF THE GAS INDUSTRY



Big Improvements by Public Service

Jersey Corporation expended $129,000,000 in Six Years and Continues to Build

Newark, N. J.—The various operating subsidiaries of the Public Service Corporation of New Jersey have expended $129,000,000 for capital improvements the last six years. Keeping a few steps ahead of the exceptional growth of Camden and vicinity and anticipating a still larger development when the new Camden-Philadelphia bridge is opened, Public Service Electric and Gas Company is about to start work on a large extension to its manufacturing facilities at Camden Gas Works. An addition will be built to the generator house sufficient to accommodate new equipment which will increase the daily capacity by 3,000,000 cubic feet of gas.

The new gas manufacturing machinery will include a waste heat boiler, centrifugal blowers and a steam accumulator. The addition to the building will be sixty-seven feet long and thirty-two feet wide and it will be of brick and steel construction. The centrifugal blowers will be housed in a separate extension, thirty-five by twenty-three feet.

This will give Camden a total capacity of 15,000,000 cubic feet of gas a day including the output of the Camden Coke Company which is 8,000,000 cubic feet per day. Add to this 6,000,000 cubic feet per day produced by the Trenton Works and the total makes 21,000,000 cubic feet a day for the Southern Division territory of the company.

These improvements, with the normal expansion of the separate companies, have placed the parent organization which controls the operating companies among the twenty largest corporations in the United States.

From the standpoint of total assets which aggregated $480,000,000 on December 31 last, Public Service Corporation of New Jersey, the holding company, is the twelfth largest corporation in this country. In the ranks of public utilities, Public Service is the fifth largest in the United States, and exclusive of Consolidated Gas of New York, it is the largest organization in the thickly populated area along the Atlantic Coast.

All the properties and assets controlled by Public Service are located in a narrow strip of land some 1,800 square miles, extending from the northeastern sections of New Jersey around New York City to Camden, opposite Philadelphia.

* * *

Gas Light Co. of Waverly Authorized to Change Thermal Standard

Albany, N. Y.—The Public Service Commission has authorized the Gas Light Company of Waverly to change its standard of gas from 585 to 537 British Thermal units, the latter being the prevailing standard among gas companies of this state. The company supplies Pennsylvania municipalities to 537 B. T. U. gas. The company is planning various improvements to its service in Waverly.

* * *

LEESBURG GAS PLANT ASSURED

Company and City Agree on All Requirements

Leesburg, Fla.—The formal acceptance by the East Coast Gas Company of the ordinance agreed upon by that concern and the city of Leesburg and the completion of final legal formalities assures the citizens of Leesburg of an adequate gas supply.

The East Coast Company applied for a franchise some time ago and an ordinance was approved by the city commission and voters on a referendum.

The ordinance covers a period of thirty years and provides for the construction of a plant and the laying of gas mains on all city streets. No expenditure of public funds is required under the ordinance and the rates for charges are definitely established for the life of the franchise. Actual work must be started by December and completed in one year. The initial plant must be sufficiently large to supply a population of 10,000 and must be so built as to permit the addition of further units as the city grows.

* * *

Muscle Shoals Gas Company Extends Plant

Florence, Ala.—Conrad H. Ohme, of the Alabama Public Service Commission, recently made a close inspection of the plant, properties and records of the Muscle Shoals Gas Company, and declared that from point of view of efficiency and high standards this company is giving a public service rarely equalled in the state.

Mr. Ohme was particularly impressed with the immense improvement program carried forward by the company during the past year, detailed report of which was made to him as representative of the commission.

At the plant excavations have been made and the contract is ready to be signed for the installation of an additional bench and retorts for the production of a greater supply of gas, and the company is placing gate valves at different points in the mains so that in case of fire or other trouble whole sections of the city may be cut off.

In additon to the improvements and extensions which have been completed during the past year the company is continuing its development on a large scale, and Manager L. P. Kleitz declares that the most active work is required to keep up with the increasing business.

U. G. I. Makes Important Administration Change

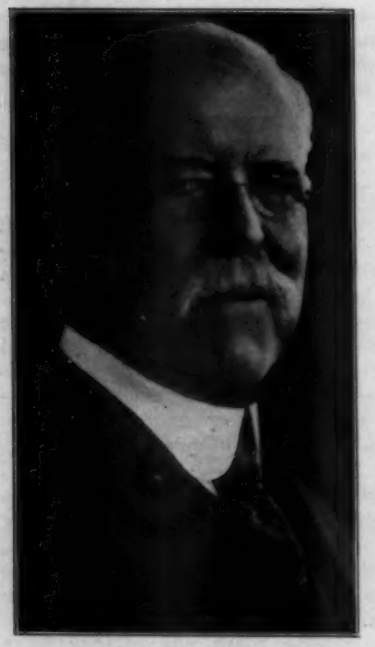
S. T. Bodine Elected Chairman of Board—A. W. Thompson New President

Samuel T. Bodine was elected chairman of the board of directors of The United Gas Improvement Company at a special meeting of the Board held this afternoon in the company's offices, northwest corner of Broad and Arch Streets.

Arthur W. Thompson, of Pittsburgh, was elected president of the U. G. I. to succeed Mr. Bodine.

Both elections will become effective September first.

Mr. Thompson is generally recognized as one of the leading



Samuel T. Bodine, Chairman of the Board, U. G. I. Co.

public utility executives in the United States. He is president of the Philadelphia company and its affiliated companies, including the Duquesne Light Company, Pittsburgh Railways Company, Equitable Gas Company, and others. Mr. Thompson is a director of the Pennsylvania Railroad and has been connected with railroad service in various executive capacities. Mr. Bodine, who has been president of The United Gas Improvement Company since 1912, began his business career as a clerk. Mr. Thompson started as a rodman in the employ of a railroad.

Mr. Bodine's Statement

After adjournment of the Board of Directors, Mr. Bodine issued a statement in which he referred to Mr. Thompson as a very congenial and helpful associate.

"It gives me great pleasure to announce the fact that I have succeeded in my efforts further to strengthen the organization of our company by securing the services of Arthur W. Thompson, and that my recommendation has been unanimously approved by the Board of Directors and made effective by my election as Chairman of the Board of Directors and Mr. Thompson's election as President, both elections becoming effective on September 1, 1926," said Mr. Bodine.

"Mr. Thompson is at present and has been for a number of years President of the Philadelphia Company and of its various sub-

Arthur W. Thompson, President, U. G. I. Co.

sidiaries which operate the gas, electric and transportation utilities of Pittsburgh, Pennsylvania, including the Duquesne Light Company, whose electric plant is confessedly one of the most efficient in the United States. He is in the prime of life and is one of the recognized successful leaders in the public utility field.

"As Chairman of the Board of Directors I shall continue to serve the shareholders as actively as in the past and with the same authority in shaping and directing the policies of the company. In this work Mr. Thompson will be a very congenial and helpful associate.

"I bespeak for both of us a continuance of the cordial support of the shareholders and approval of the public which has been so helpful in the past, and which makes a life devoted to the Public Service so well worth while."

Arthur Webster Thompson was born at Erie, Pa., May 8, 1875, the only son of Sheldon E. and Laverne Thompson, both of whom were of old New England lineage. After completing his public school and high school courses he entered Allegheny College at Meadville, Pa., from which he was graduated with the degree of C.E. in 1897.

While still in college he began work as rodman on location work with the Pittsburgh, Bessemer and Lake Erie Railroad. Following his graduation he served a year as draftsman for Wilkins and Davison of Pittsburgh. A short while after he joined the Baltimore and Ohio as chief of a party on surveys. He was with the B. & O. from 1900 to 1918. Starting as assistant division engineer at Pittsburgh, he rose rapidly to the position of chief engineer of maintenance of way in 1907. In 1910 he was made chief engineer of the Baltimore and Ohio System and in 1912 was appointed third vice-president in charge of traffic and commercial development, and on June 1, 1918 he was made Federal Manager by the United States Railroad Administration of several large eastern railroads. On February 1, 1919 he joined the Philadelphia Company as president.

Mr. Thompson is a director of several large concerns, including the Pennsylvania Railroad, Union Trust Company of Pittsburgh, Eastern Rolling Mills Company and others. He is also a member of the American Society of Civil Engineers, National Electric Light Association, American Electric Guild, and American Railway Association.

Beach Park Spends About $50,000 For Gas Main Extension

Tampa, Fla.—Nearly $50,000 was expended by the Beach Park company in installing gas mains throughout the suburb, according to T. Roy Young, president.

Work of installing the main lines was completed last fall and now laterals have been extended to virtually every section of the property.

With the completion of this work Beach Park gained recognition of being the remotest residential area in the Tampa area to have the service. Nearly all homes in the suburb use gas.

* * *

J. C. Pew Elected Vice-President of Columbia Gas

Rome, N. Y.—John C. Pew, president of the Sunship Building & Drydock Co. of Chester, and vice-president of Sun Oil Corp., has been elected a vice-president of Columbia Gas & Electric Co. Mr. Pew is an authority on natural gas.

* * *

Stephen R. Burton Dies

Cincinnati, O.—Stephen R. Burton eighty-six, a retired banker and business man, died recently at his home here. He was born in Albany, N. Y., in 1840. At one time he was president of the Lafayette National Bank, vice-president of the Central Trust Company and a director in the Cincinnati Street Railway Company, the Cincinnati Gas Company, Dayton & Michigan Railroad, the Little Miami Railroad and the M. & M. Insurance Company.

* * *

New Officers of the P. U. Advertising Association Elected

The following new officers of the Public Utilities Advertising Association were chosen during a recent meeting in Philadelphia:

President, Frank L. Blanchard, Henry L. Doherty Company; Vice-President, George F. Oxley, National Electric Light Association; Hal. M. Lytle, Chicago Rapid Transit Company; Secretary, Henry Obermeyer, Consolidated Gas Company of N. Y.; Treasurer, Charles W. Person, American Gas Association.

Though one of the youngest departmentals of the International Advertising Association, the public service group reported a membership of more than 300, representing 225 utility companies throughout the country.

Public Service of N. J. Makes Organization Changes

J. G. O'Keeffe and F. A. Lydecker Earn Promotion

East Orange, N. J.—Classmates at Stevens Institute of Technology, and graduating in 1907, two Public Service men—James G. O'Keeffe and Frederick A. Lydecker—are appointed general superintendents in the gas department of Public Service Electric and Gas Company the same day. Mr. O'Keeffe, now engineer of construction, becomes general superintendent of manufacture and Mr. Lydecker, now assistant general superintendent of distribution, becomes general superintendent of distribution. Both appointments became effective July 1 and were made by John A. Clark, the new vice-president in charge of gas operation. Both report to Herbert H. Ferris, the new general manager.

These appointments have also been made by Mr. Clark:

Charles W. Smythe, now assistant to the general superintendent of manufacture, to be assistant general superintendent of manufacture.

Harry Ellis, now engineer of distribution, Southern Division, to be assistant general superintendent of distribution.

William H. Bettle, now superintendent of meters, Essex Division, to be general superintendent of meters.

William H. Chadwell, formerly superintendent of Front Street Gas Works, Newark, now attached to the drafting department, to be assistant construction engineer.

Mr. O'Keeffe, after graduation from Stevens, became cadet engineer at Front Street Works and in the Newark distribution department. In January, 1909, he was made assistant superintendent of distribution, Newark District, and in October, 1911, superintendent of Front Street Works. In October, 1913, he was made superintendent of Market Street Works, and in April, 1918, went to the Brunswick Avenue Works, Trenton, as superintendent. In 1922, he returned to Newark as engineer of manufacture, Essex Division, and became engineer of construction in 1925. Mr. O'Keefe lives in Verona.

Mr. Lydecker first spent a year and a half with the Thompson-Starrett Company in New York, and came to Public Service in 1908 as a cadet engineer. He was at Market Street Gas Works for three years. In 1911 he was assistant superintendent of the Summit and Morristown district and superintendent in 1912. He went to Newark as superintendent of distribution in 1916, and in 1917 was made engineer of distribution of Essex Division. In September, 1922, he became assistant general superintendent of distribution. He lives in Glen Ridge.

* * *

Indiana Gas Merger to be Considered

Indianapolis, Ind.—A formal hearing will shortly be heard before Samuel R. Artman, member of the Public Service Commission, on the request of the Indiana Gas Utilities Company for permission to take over and merge the gas companies which manufacture and supply gas to patrons at Brazil, Terre Haute and Richmond. The properties to be embraced in the merger are said to have a value of about $3,000,000 or $4,000,000.

The Indiana Gas Utilities Company, J. W. McCardle, is backed by New York capital.

The company asked the commission for authority to buy the properties of the Citizens Gas and Fuel Company of Terre Haute, the Brazil Gas Company of Brazil and the Richmond Light, Heat and Power Company of Richmond. It asked authority to issue $2,250,000 in mortgage bonds, $500,000 in preferred stock at 7 per cent. and 40,000 shores of common stock of no par value, to pay for the properties proposed to be acquired.

The petition said if the application is granted, it contemplates the construction of a gas manufacturing plant at Clinton to give service to that city.

In anticipation of the proposed merger, the petition sets out that the Richmond company voluntarily has reduced its rates, and it is planned to reduce the rates at Brazil and to improve the service there. The petition was filed by John T. Beasley of Terre Haute.

Bridgeton Gas Light Co. Plant Is Spotless

Bridgeton, N. J.—Bridgeton householders are using gas to such an extent that the output at the Bridgeton Gas Light Company has doubled during the years between 1916 and 1925, inclusive, and so that the first six months of this year have shown one of the biggest increases in the history of the company. Now it is necessary for the two large tanks to be filled one and a half times each day to supply the demand of the city.

One of the remarkable points about the gas business in Bridgeton is the manner in which citizens have stuck by gas for illumination purposes. More and more gas is being used for cooking and the heating of water. House after house is being equipped with automatic gas heaters and builders today are constructing their houses with a view to the dweller installing gas ranges for cooking. Gas has been instrumental in causing contractors and architects to design dwellings with one chimney instead of two as in former years.

Industrial Users

Industrial concerns in Bridgeton are large consumers and make heavy demands on the tanks. With the warm weather season housewives make use of cold meals a lot while those who in the winter months use a coal fire for cooking, are using gas. Among the large concerns using gas in their factories are the Martin Dye Works, the American Can Co., Geo. L. LeSturgeon and the Illinois Glass Company.

The latter company use the Bridgeton Gas Company's gas in one of their operations exclusively, while in others they use gas of their own manufacture. In the one process where clean gas is necessary they have to use the Bridgeton Gas Light Company's product because their own gas contains considerable sulphur.

The plant of the Bridgeton Gas Light Company is remarkable for one real big reason. In nearly every city will be found the gas plant among the slums or in a district that is far from inviting from a residential standpoint. However, the plant of the local company is in the midst of a residential district and the appearance of the grounds are such that they are advantageous to the district. Bordering the plant are homes of good appearance.

Lawns and Flowers

Beside the office of the company are splendid lawns and flower beds, and the fences and walls surrounding the plant are all freshly painted and kept in such a manner that they are a credit to the management of the company. Mr. Jacob B. Jones, the manager, is a firm believer in keeping his grounds and plant absolutely clean and is doing his share in making Bridgeton beautiful.

An inspection of the plant showed clearly that every department vies with its neighbor in keeping its floors, etc., clean. Even in the retort room where coal and coke is continually handled, the cement floor was quite free from ashes, stray coal and coke and other rubbish.

The plant was built by Bridgeton people with Bridgeton money sixty-eight years ago. At that time a few citizens of the city felt the need for gas and they started the business. At the present time Bridgton has a gas plant owned by Bridgeton people, owned and operated by Bridgeton capital and employing only Bridgeton citizens, that is considered to be five years ahead of the times. The plant is so equipped with dual machinery that a breakage will not cause them to shut down.

Enviable Record

Not for one second during all these sixty-eight years has this company been forced to turn off its supply of gas to its consumers. It is equipped in such a manner that immediate action can be taken to repair any breaks away from the plant as well as in the plant itself. And another notable fact is that never since the first furnace was lighted has the fire been out. When it is necessary to draw a furnace for repairs and it is time to light up again, a portion of the fire is carried from another furnace, so that the original fire is still burning.

GAS MERGER TO BRING BETTER SERVICE

Economy of Operation Also Seen

Pleasantville, N. J.—As a result of the merger of the Pleasantville Gas Company and the Atlantic City Gas Company under the name of the former corporation, improvements which will meet greater economy of operation and increased service in this city and at other points on the mainland are expected.

The merger approved recently was made by the New Jersey public utilities commission, meeting at Trenton. At the same time the commission approved $582,000 face value promissory notes, and the issuance of preferred and common stock of the consolidated company of a like kind and manner is now outstanding for the Atlantic City Gas Company, to be exchanged for the stock now outstanding, share and share alike.

The Pleasantville company is 25 years old and for many years did not pay dividends. For the past two years the company has been paying stock dividends of 8 per cent. semi-annually.

* * *

Sussex Gas Company Changes Hands

Seaford, Del.—The Sussex Gas Company, of this town, which supplies fuel and light for Seaford, Bridgeville, Blades and Laurel, has been sold to the Consolidated Gas Service Corporation of Wilmington, of which C. P. Holzderver is president. The majority of the stock was owned or controlled by Henry M. Tracy, of Philadelphia, secretary and treasurer of the company, which was acquired several weeks ago, and the balance of the stock, both common and preferred, was purchased by the new company from the small shareholders on the same terms. The recent purchasers promises improved services and will take charge July 1, 1926.

The new company has purchased of the Delaware Trust Company, their former banking house, corner High and Conwell streets, which they will use as an office and sales room for stoves, fixtures, etc.